Space Weather Forecast

Issued on Thursday, 01 December 2022 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/Minor Storm intervals day 1 (1st). Chance of M-flares. CME arrival possible late day 3 or day 4 (3rd or 4th), but low confidence.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with a Moderate flare observed from a small and relatively simple sunspot on the northwest disc. There are two further notable spots, with a larger and potentially complex region rotating onto the Suns southeast limb, along with another small but very slowly growing spot in the southern centre disc. Another very small bipolar region has also emerged in the northeast, whilst a further region is also gradually rotating onto the northeast limb, but is currently too close to it to fully assess. A moderately fast coronal mass ejection (CME) the Moderate flare has was observed, but is still under analysis.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of the fast solar winds from a coronal hole. Wind speeds have been Elevated to Strong, varying between 550-700 km/s. The total magnetic field strength, was mostly Moderate, but declined to be weak at 01/0945 UTC. The north-south component oscillated between moderately positive and negative values. Geomagnetic activity was Unsettled to Active with two periods of G1/Minor geomagnetic storms (30/1800-2100 UTC and 01/0300-0600 UTC).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low, but with a chance of rising to Moderate with an ongoing potential for M-flares, primarily from the new region in the southeast.

Solar Wind / Geomagnetic Activity: Slow CME arrivals are possible, mainly early day 4 (4th), due to a CME from the 29th from a large line of plasma (or "filament") being released from the Sun. Although confidence is low with the timing. The CME from the M1-flare on the 1st has yet to be fully assessed. Otherwise, ongoing coronal hole sourced fast winds are expected to only gradually decline through the period. Unsettled to Active geomagnetic conditions, with an ongoing chance of further G1/Minor storm intervals on day 1 (1st) will ease to Quiet to Unsettled, with a chance of Active intervals by day 3 (3rd). There is a chance of further isolated G1/Minor storm intervals from any CME arrival day 4 (4th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	70	20	10	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	25	25	25	25
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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